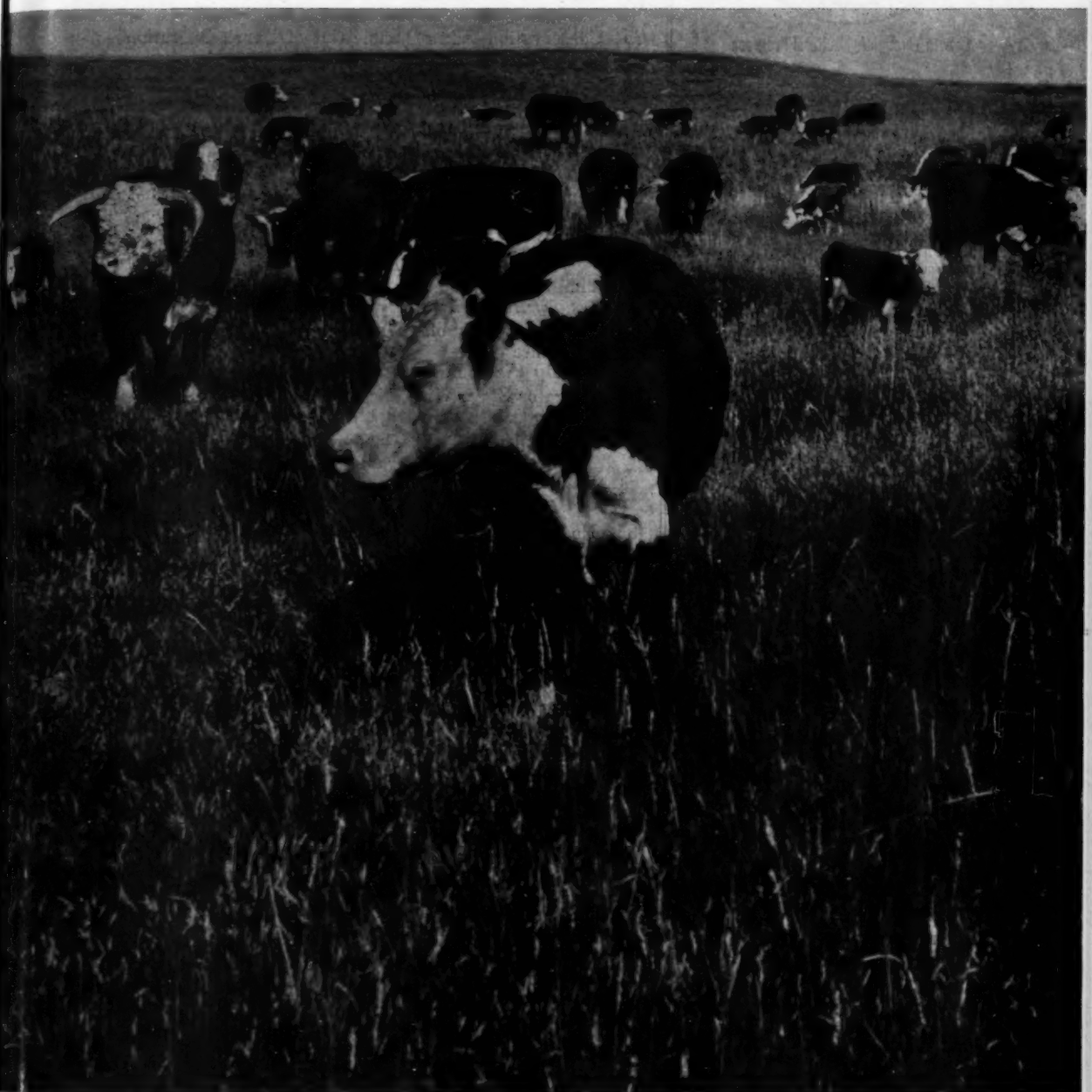
NOVEMBER 1961

Soil Conservation



SOIL CONSERVATION SERVICE • U. S. DEPARTMENT OF AGRICULTURE

VOL. XXVII, No. 4 NOVEMBER 1961

Growth Through Agricultural Progress

"Because the ground is chapt, for there was no rain in the earth, the plowmen were ashamed, they covered their heads. Yea, the hind also calved in the field, and forsook it, because there was no grass. And the wild asses did stand in the high places, they snuffed up the wind like dragons; their eyes did fail, because there was no grass."

—JEREMIAH, 14: 4-6

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COVER PICTURE—Conservation range management pays top grass dividends for Jess McGinley on his 35,000-acre ranch in the Cherry County (Nebr.) Soil and Water Conservation District, as it does for thousands of other Great Plains stockmen.

Soil Conservation

ORVILLE L. FREEMAN
Secretary of Agriculture

DONALD A. WILLIAMS
Administrator, Soil Conservation Service

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FRANK B. HARPER, Editor

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Great Plains Conservation Program

—Tailored To Fit a Region

By Donald A. Williams

LAND and people in the Great Plains are sharing the benefits of soil and water conservation planning and action locally initiated and carried out with Federal or other technical and financial help.

In no other major agricultural part of the Nation is what happens on the land more sharply reflected in the area's economy and the welfare of its residents than in this 386-million-acre region occupying the major part of 10 States from North Dakota to Texas. In World Wars I and II, it lived up to its name as the Nation's "breadbasket," and in the drought years of the 1930's it put "dust bowl" into the dictionary.

By the same token, no other part of our country was better suited to demonstrate the practicability of soil, water, and plant conservation and its beneficial effects in rural area development. Today's nationwide soil and water conservation program grew out of the Great Plains' need for conservation action in the drought years. Plains land owners and operators have demonstrated over the years since that it is economically feasible to use tillage, cropping, pasture-management, water conservation, and other measures that help to offset the damaging and costly effects of dry years.

They have done so by using various conservation "tools" made available since the mid-thirties. These have included farmers' and ranchers' soil conservation district programs, Agricultural Conservation Program cost-sharing, the Conservation Reserve Program, watershed-protection and flood-prevention projects, Farmers Home Adiministration lending, and other financing.

An unique approach to Great Plains soil and water conservation problems, and one that already is amply proving its practical effectiveness, is that being made through the Great Plains Conservation Program. It is the first time that a conservation program, suggested by responsible agricultural leaders of the area, has been tailored to fit the specific conditions and problems of a single whole region as a unit. This program also is fundamentally different in that the law authorizing it requires participating land owners or operators to have complete conservation plans for their farm or ranch units, in order to be able to receive Federal cost-share payments, under voluntary 3- to 10-year contracts.

The program's emphasis is upon sound land use, within the existing local-State-Federal framework of conservation action in the Great Plains. Through it, as more and more operators have found each year since the program's actual start in late 1957, the people of this area are able to do a still better and faster job of safeguarding their soil and water resources.

For example, at the end of the last fiscal year there were approximately 7,000 Great Plains Conservation Program contracts in effect, covering more than 18 million acres, with a backlog of about 3,000 applications. Significantly, 608,000 acres, or 28 percent of all the cropland on participants' farms or ranches, had been or will be converted to permanent vegetation since the program began, most of it under program contracts. In addition, 557,000 acres of range had been reseeded or planned. That is not to mention water conservation, cropping, windbreak planting, and other measures involved in their basic conservation plans.

Dry 1961 in parts of the northern Plains reminds us that drought and its individual and community hardships may be expected in the future. But this year's experience was different in one all-important respect: In the 1930's we were unprepared for such climatic disasters. Today, soil- and water-saving measures are proving their effectiveness in lessening the effects of dry seasons on the land, its operators, and their communities.

When enough land unsuited to cropping is back in grass as Nature intended, and has the benefit of other conservation treatment, the Great Plains region will experience an economic stability never enjoyed before in the hazardous areas. With less chance of failure, those farms and ranches planned, treated, and managed according to the proved sound principles of the Great Plains Conservation, soil conservation districts', and related programs will be better financial risks in periods of drought. We may expect drought and water shortages to become less and less formidable in the future as this conservation work progresses.

Drought-defying Conservation Farmers REPORT

By Tarleton Jenkins

NOTHING makes soil and water conservation farmers show up better than does drought like that which has lasted up to 3 years or more in places in the northern Great Plains.

Although nobody escapes its blight, conservation farmers and ranchers have been getting along better than their nonconservation neighbors, as a sampling of their experiences in the dry areas confirms.

Take, for example, farmers in the Fall River County Soil Conservation District in South Dakota, who experienced 2 record dry years in succession in 1960 and 1961. Range grass did not grow this year; and irrigation ditches carried only a fraction of their normal flow, after a 1960 water allotment only a third of normal. The important sugar-beet crop did not mature; winter wheat had been destroyed by winter winds; and spring wheat made a poor crop generally, hail destroying some of the better stands.

Grass comeback after brush control under GPCP on L. V. Gills ranch in Upper-Pecos (Tex.) SCD.

Richard Anderson of Burdock, in the Fall River district's driest part, reports he actually increased production on his range. He credits his conservation use of grass, along with stockwater development and fencing for more even grazing. He cut hay on a pasture which had only one irrigation.

In order to be completely safe, Anderson reduced his cow herd to only a few milk cows. He plans to restock his cattle when more nearly normal rainfall returns, meanwhile figuring his range will be all the better for the rest—an investment, not an expense.

A trademark of conservation farmers is their store of feed against dry times, Eugene Staggs in the Wibaux, Mont., Soil Conservation District is representative. He has an abundance of hay in stack and more feed in reserve in his pastures. He could have cut still more hay in his buffer strips, but he left them to protect his land against soil blowing. Staggs also put down a well where he and his neighbor, Adrian Galster, both could use it for their cattle.

Harold Tolksdorf in the Richland County Conservation District, also in Montana, said he would have had to dispose of his herd as early as the summer of dry 1959 if it had not been for his soil and water conservation work. His complete conservation plan includes a water-spreading system that has assured him a hay crop.

Stubble mulch through GPCP plan on Mrs. M. A. Bush farm in Wichita-Brazos (Tex.) SCD.

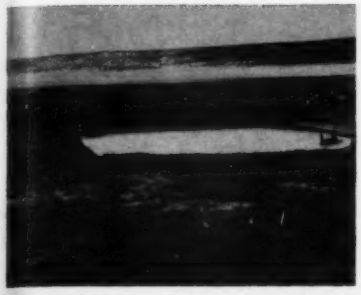
He had a good supply of hay in 1961 that he had carried over from 1960; and his pastures have an abundance of old grass—just in case.

William Knauss and Cliff Breckheimer, near Tonla in northeastern North Dakota, figured their 1961 wheat yield at 2 to 3 bushels an acre more than that of farmers not using conservation practices. Knauss' pastures went through the season in good to excellent condition in spite of the poor rainfall. He said that in his opinion farmers without enough pasture now are those who didn't have enough to start with.

In the same area, Arnold Olson of Bartlett estimated that conservation measures meant 3 or 4 bushels more an acre in his flax yield.

In northwestern North Dakota's Lower Yellowstone Soil Conservation District, farmers in 1961 got wheat yields ranging from 12 to 18 bushels an acre; while those not using conservation rotations with good soil management harvested only 5 to 10 bushels.

Note:—The author is Field Information Specialist, Soil Conservation Service, Denver, Colo.



Dugout on R. K. Wootten ranch in Mora-San Miguel SCD, N. Mex.

A. J. Briar, who has developed a complete soil and water conservation plan since 1956, said his pastures have continued to improve, in spite of drought, with key grasses making seed this year. His 360 acres of hayland produced 450 tons, which he invited neighbors to cut on halves.

"It was quite a help to them," Briar said with understandable satisfaction.

Irrigation farmers, too, have their troubles when the water supply is curtailed. Andrew Cayko in the Lower Yellowstone district was able to irrigate 65 acres with the water he is allowed, because of improvements he has made in his irrigation system, with help from his soil conservation district and the Soil Conservation Service technicians assigned to it. Otherwise, he would have been able to irrigate not more than 35 acres, and not very efficiently at that. And he has been able to reduce labor costs considerably in the process.

"I'll make a profit this year as it stands," Cayko said. "With the old system it would have been different."

In the Perkins County Soil Conservation District down in South Dakota, drought has brought no disaster to the Veal Brothers, who have been practicing soil and water conservation for years. They harvested their usual large acreage of hay this year.

"We normally don't harvest hay for sale," Ed Veal reported, "But this year we have sold to our neighbors when they ran short."

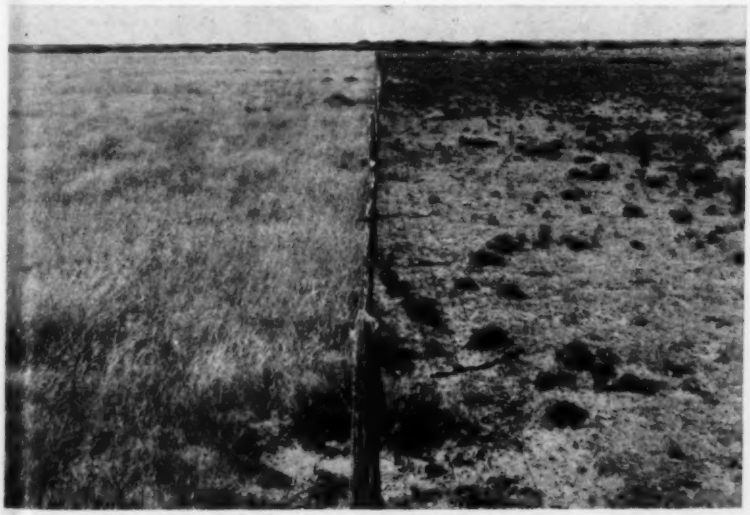
A good carryover of old grass on the Veal range is an objective each year. A reliable system of wells and stock tanks also has relieved the Veals of stockwater worry in an area where others suffered from a serious water lack.

Emil Streyle in the Dewey County Soil Conservation District near Isabel, S. Dak., harvested an average of 17 bushels of winter wheat this year, which topped the average reported by his neighbors by 5 bushels. Streyle credits his stable yields to terracing and stubble-mulch tillage, along with a grass-legume rotation.

Ensilage sorghum 12-plus feet high grown by Kenneth Zimmerman in Decatur County (Kan.) SCD under his GPCP.

In the same area, Jack Leibel of Glencross, who has been a conservation farmer for 3 years, says there was a well-marked difference between the land which had the benefit of soil conservation treatment and adjoining land. His corn on a conservation-treated field outyielded that of a neighboring field by 15 bushels an acre, he said. He has applied about four-fifths of the needed soil and water conservation practices to his farm in cooperation with the Dewey County district.

These are but a random few among the uncounted numbers of farmers and ranchers who have similar drought-defying experiences to report as a result of using soil and water conservation measures through their soil conservation district and Great Plains Conservation programs.



Good pasture (left) resulting from deferred grazing contrasted with poor pasture on other side of fence.

Early GPCP Contract Brings Many Benefits

By James D. Abbott

Grass in 1960 on denuded range overseeded in 1958.

Schuster (center) and SCS technicians study native range to be revegetated under his GPCP.

Wheat stubble mulch on Schuster farm.

BETTER crops and grass and an end to wind erosion are among the benefits being reaped by H. E. Schuster and son Jack on their Texas farm from one of the first Great Plains Conservation Program contracts in the Nation to be signed and completed.

Actually, their 3-year contract, signed on December 20, 1957, was No. 4, preceded by one in North Dakota and two others in Texas the day before. The contract for the Schuster farm, near Muleshoe in Bailey County, was completed December 31, 1960.

The elder Schuster started his soil and water conservation program in 1950, when he became a cooperator with the Blackwater Valley Soil Conservation District. Because of the financial outlay needed to build structures and apply some of the other practices called for in his district plan, he figured the Great Plains cost-sharing program was made to order for enabling them to speed up their conservation work. The results have proved he was right.

In completing their contract, the Schusters revegetated 276 acres of their cropland to native grasses, established 5 conservation-irrigation systems requiring 1.55 miles of underground high pressure pipeline, built 8.9 miles of terraces and 1.2 miles of diversions, practiced proper use on 361 acres of rangeland, and used all the practices necessary to make their conservation cropping system work properly.

With the completed conservation program in operation, Schuster decided to retire and turn the farm over to Jack and his son-in-law, Jim Green. Schuster takes satisfaction in the fact that he turned the land over to them in much better shape than when he began to farm it, and is counting on them

Schuster examining blue grama seed stand on land permanently retired from cultivation.

Note:—The author is area conservationist, Soil Conservation Service, Lubbock, Tex.

to continue making improvements as new conservation methods are developed.

The Schusters' cropping system has stopped wind erosion almost completely. Cotton following rye and vetch yields much better, because of improved soil condition and fertility. Their cotton makes between 1½ and 2 bales an acre, depending on growing conditions, or more than twice the county average on the same type land. Tomatoes that followed fertilized rye produced approximately 14 tons to the acre.

Grain sorghum, planted in 20-inch rows, yielded 5,200 pounds an acre in 1958, 5,800 pounds in 1959, and 6,000 pounds in 1960. It not only produced more feed but provided more effective wind-erosion protection and did a better job in improving soil tilth. The Schusters also have used a complete fertilizer program with their conservation cropping system.

The Schusters found that their sprinkler systems have made it possible to get an even crop over all the land, and have made their irrigation water go a great deal further than before they had their conservation program.

They also now have excellent grass on their native range and pasture land. "Some of it so thick you can't see the ground," as Schuster Senior says. In spite of some failures in establishing grass on depleted and eroded lands, the Schusters kept trying until they got the desired stands.

"If I were to buy another place now," H. E. Schuster said, "I would like to use the program on it to give the complete treatment needed. Something has to happen to you before you become a real believer in soil and water conservation."

Conservation Takes Gamble Out of Wyoming Ranch Operation

By Albert P. Thatcher and Brent J. Harrison

WYOMING rancher John H. Simpson uses conservation management to take the gamble out of his 11,000-acre ranch operation in the Intermountain Soil and Water Conservation District.

"I feel that grass management should be placed on an equal basis with livestock management," he said. "I just watch the grass, and when it is used to about 50 percent, the livestock is moved."

Simpson's native pasture early in the spring of 1961 had plenty of grass remaining after dry 1960. Simpson also gives his pasture a chance to rest during the growing season once every few years.

"Many people get the idea that I'm a poor livestock manager," Jack said, "because I let my cows live on grass and don't keep them up near the house for calving and wintering. I've found that when there is plenty of grass on the range, the only time the livestock need hay is when it is covered with snow. My winter feed costs are low, and also the labor costs.

"I calve my 2-year old heifers without much trouble, because they have plenty of grazing throughout the year. They aren't short of grass for part of the year and then fed extra prior to calving. In this way they can grow uniformly the year around."

Jack studied to be an engineer in college in Colorado; but he always loved the land, and when he came back to Wyoming for a summer vacation in 1932, he stayed, starting in the ranching business by homesteading. He took over management of a large ranch in 1937, and in 1951 took advantage of an opportunity to buy a ranch of his own.

He was faced with two choices—stock heavily and gamble with the climate by trying to pay off the debt in a short period, or stock lightly and pay it off more surely over a longer time. Because of his previous experience, and having seen what happened to both the grass and the livestock when there

3-year-old windbreak surrounds one watering place.

Note:—The authors are range conservationists, Soil Conservation Service, Casper and Gillette, Wyo., respectively.

Simpson checks grass growth in 1961 on one of the small meadows developed by building water spreaders.

was a shortage of forage on the range, he decided to stock at a light enough rate to allow for range improvement and still provide sufficient forage, even in times of drought.

"While I didn't make a killing in any one year," he recalled, "my net income and growth has been steady; my grass has improved; my son is going to inherit a productive ranch; and I have fulfilled my duty in taking care of the land."

Simpson's steers have averaged about 680 pounds and his lambs about 90 pounds at market.

Simpson always has hay in reserve—3-year-old stack in foreground, with bales of 1961 crop and left-over 1960 crop in background.

Simpson entered into a contract under the Great Plains Conservation Program in the spring of 1959, in order to speed up his conservation work. Previously, much of his cropland was block-farmed and subject to wind and water erosion. Through this program, he has planned or installed more than 15 miles of terraces, 300 acres of wind stripcropping, 180 acres of contour stripcropping, and a grassed waterway. He harvested 16 bushels of wheat an acre in 1961, while his

One of 3 wells being drilled for water in outlying pasture.

neighbors were cutting theirs for hay or turning stock onto it. His 8-year average has been 20 bushels.

He also has seeded more than 150 acres of his least productive cropland to crested and intermediate wheatgrass, which now is being cut for hay and pastured, and small areas of poor cropland within native pastures back to native grasses. He likewise has installed many small erosion-control dams to heal gullies, and check dams to hold back water to produce hay. He has built cross fences to enable him to practice deferred grazing. Of last year, which was exceptionally dry, he said:

"I didn't get through putting up hay; I just quit."

The job is not finished. This 1961 scene shows soil blowing from an unprotected field in a northern Plains drought area.

A Program for the Plains

By Cyril Luker

THE Great Plains Conservation Program may set a pattern for dealing with soil and water conservation problems on a coordinated regional basis.

This program, already proving its effectiveness in the 10 Plains States, supplants no other conservation undertaking and requires no separate agency to administer it; yet it has stimulated, through its voluntary cost-sharing mechanism, a speeded-up drive by Plains farmers and ranchers to take hazardous lands out of cultivation and to apply complete soil, water, and plant conservation systems on the rest of their holdings and thereby assure the stability of their operations.

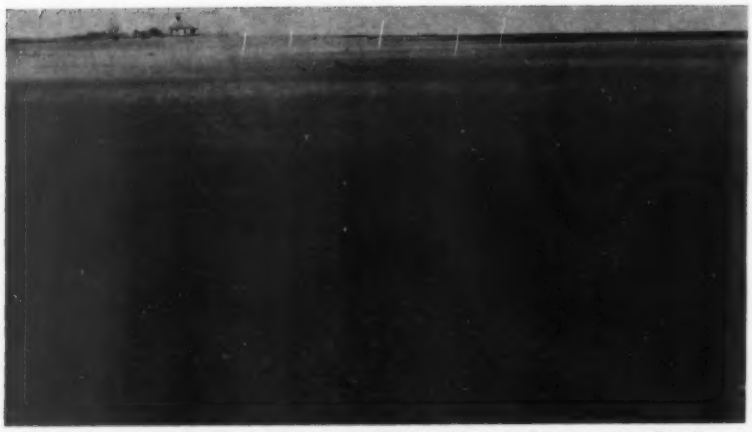
The Great Plains Conservation Program is a long-term soil and water conservation program authorized by Public Law 1021 in August 1956. It is designed to meet the needs of the Plains part of an area consisting of 422 counties extending from the Rio Grande in Texas to the Canadian border of North Dakota and Montana. In these 422 counties live 335,000 farmers and ranchers, who normally produce 60 percent of the Nation's wheat and 37 percent of its beef. The hazards of climate, variable soils, and economic conditions have, in combination, often made agricultural production uncertain in this vast area.

The Great Plains Agricultural Council recommended this program as a means of providing a greater degree of agricultural stability in this highly productive area. The program is tailored to fit the particular needs of this region and those of individual operating units. It provides assistance to farmers and ranchers for carrying out plans that include sound cropping and grazing systems, land-use changes, and the application of enduring soil and water conservation practices.

The Great Plains Conservation Program is an intensification of the conservation work that land owners and operators have been doing through their soil conservation districts. Soil conservation district leadership has played a prominent part in developing and carrying out this program from its beginning. A distinguishing feature of the Great Plains Conservation Program is that it enables soil conservation districts to speed up the application of conservation work that otherwise would move much slower.

It brings together into one plan all conservation program assistance of the Department of Agriculture and the States for doing the complete job. Farmers and ranchers may select cost-sharing practices in different programs, including P.L.

Note:—The author is assistant to the Administrator, in charge of the Great Plains Conservation Program, Soil Conservation Service, Washington, D. C.



This pasture near Dalhart, Tex., looked like this in 1937 as a result of past heavy grazing and wind-erosion damage.

Here is how it looked in 1961, after several years' cultivation before being reseeded to grass.

1021, that best meet their needs. They add the annual recurring practices that round out the basic requirements of a complete plan.

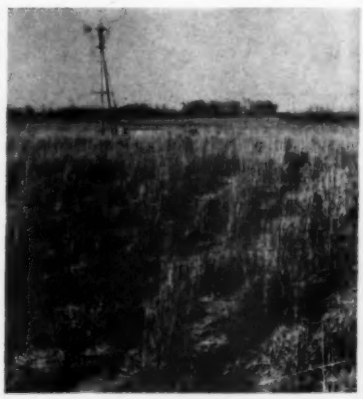
Along with the land-treatment practices, the farmer or rancher also selects land that surveys indicate is substandard for cultivation and schedules it for planting to grass. Needed land-use change was the leading point of consideration in the passage of the Great Plains Conservation Program legislation. About one-third of the cropland in plans written to date has been contracted for conversion to permanent grass.

In addition to the coordinated effort of the Department of Agriculture on physical conservation problems through the program, a better base is provided for other types of assistance such as conservation loans, crop insurance, and educational and research programs.

A fundamental aspect of conservation is that of making certain that planned conservation work is applied to the land in the shortest practicable time. Cost-sharing for practice installation assists greatly in speeding up this program. Cost-sharing under P.L. 1021 is designed primarily to help farmers and ranchers do those things they are unable to do without such financial aid. Cost-sharing is provided for permanent, nonrecurring practices, and all annual, regular farming-type practices are installed at the producer's own expense.

Cost-sharing to carry out the combinations of practices the farmer sets up in his basic plan is obligated at the time the plan is made. This arrangement insures the availability of funds to carry out the practices as rapidly as practicable.

Of $50 million appropriated up to this time, about $35 million has been spent or obligated. The law authorized no more than $150 million over a 15-year period beginning in 1956 for cost-share pur-



Former cropland on P. E. Starr farm in Salt Fork (Tex.) SCD reseeded to native grasses, with well for water.

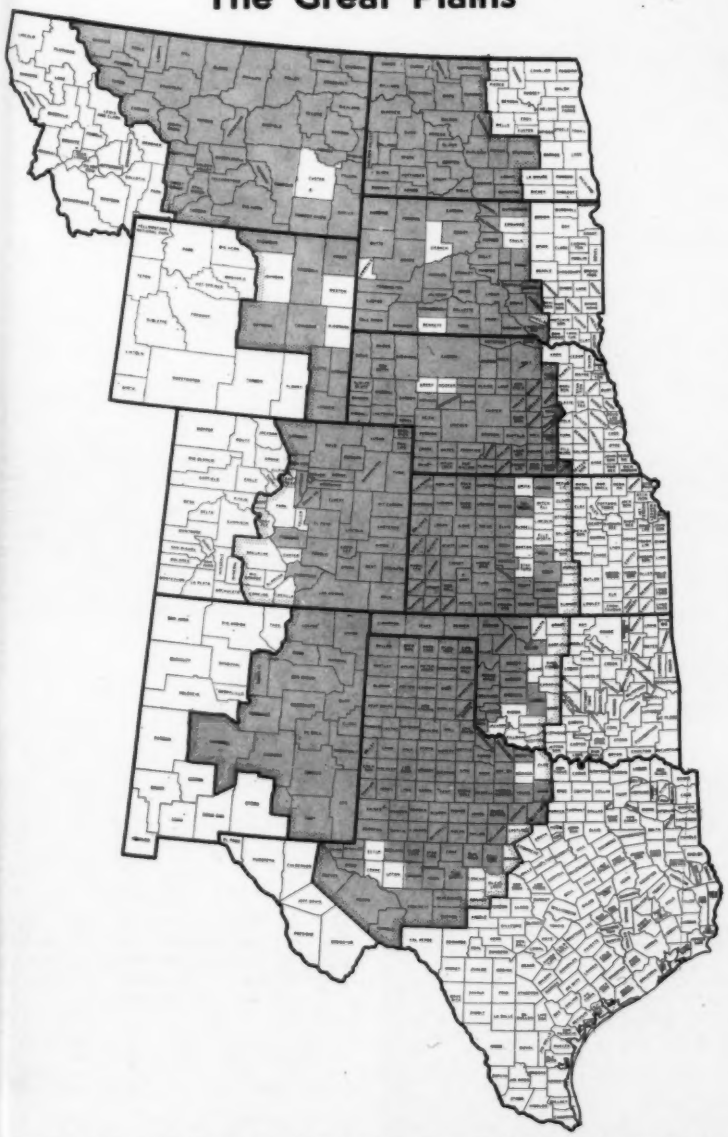
Johnsongrass grown on land with water-spreading system on Jack W. Stone ranch in Toyah-Limpia (Tex.) SCD.

poses. No more than $25 million can be spent for cost shares in any one program year. The program comes to an end December 31, 1971.

The principles of this program call for use of all the land on the farm within its capability. In most cases, substandard cropland is shifted to grass, and allotted acreage of basic crops is shifted to the remaining cropland.

Progress of conservation work through the Great Plains Conservation Program since the first contracts were signed in December 1957 has been as rapid as available funds and technical assistance would permit.

The Great Plains



Map of 10 Great Plains States showing boundary of 422 eligible counties and (shaded area) 361 counties designated to June 30, 1961, for participation.

Assistant Secretary Frank J. Welch.

It Can Be Done

"Landowners and operators can control the conditions that turn drought into calamity," Assistant Secretary of Agriculture Frank J. Welch said in a statement to the 1961 meeting of the Great Plains Agricultural Council. "They can do so by treating and using their lands in such a way as to give them maximum protection against moisture failure and the ravages of wind and insects.

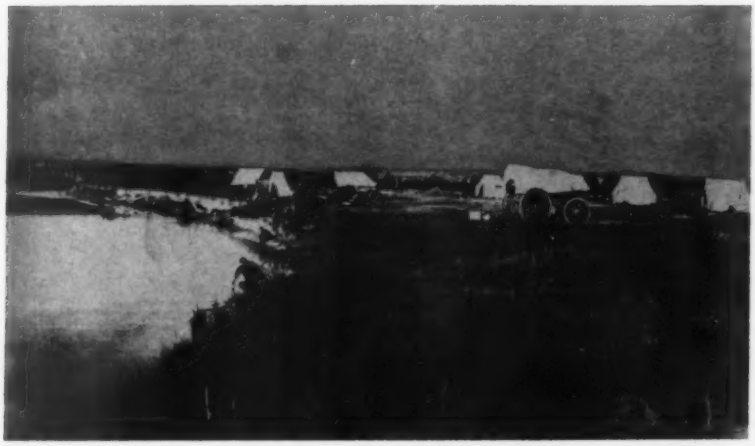
"Great Plains farmers and ranchers have made great progress in utilizing soil and moisture conservation, financing, and the other aids that first began to be made available to them in the thirties.

"A tremendous amount of work remains . . . Many thousands of farms still need the benefit of long-range land-use adjustments.

"This is no overnight undertaking, we know, and all of us must do everything we can to speed up this vital work. That includes your Great Plains Agricultural Council through its advisory guidance; the U. S. Department of Agriculture through its technical, financial, research, and educational facilities; State and local agricultural agencies, from the experiment stations and land grant colleges to soil conservation districts; and, most importantly, all landowners and operators."

The Changing

Native buffalo did not have to worry about having enough to eat—there was grass in abundance almost everywhere.



U. S. Geologist F. V. Hayden reported finding his 1870 expedition camps like this one in present Uinta County, Wyo., "very pleasant, with abundant grass for our animals." This picture by W. H. Jackson also shows the clear water of Black's Fork.

This is what men and their plows did to great acreages of Plains land over the years, particularly during the World War I and II periods.

Great Plains

Neither did the longhorn cattle which the first stockmen ran on the still bountiful range where the buffalo had roamed.

Less than 70 years later, the stream was half filled with sediment, and the grass had been replaced almost entirely by brushy vegetation—all within the life span of those who had used, or misused, the land during the intervening years.

Today, millions of acres of once-cultivated land and depleted range are being restored to the grassland abundance of yesterday through conservation seeding and management.

Grass + Water = Beef x Pounds

By Charles Reagin

TO a rancher like Bob Shoemaker of Colorado soil and water conservation can turn up a lot of side benefits.

For example, there's riding time. Shoemaker says he can check his herd in about half the time it used to take, because of better spacing of his water developments, with his herd feeding more of the time instead of traveling from one end of the range to the other for water.

And there's the important item of better condition of the cows at calving, as a result of his having cut the size of his herd and having better grass and more hay and silage for the remaining animals.

But the major benefit is enough feed for the winter. When you buy hay at winter prices, you get this part of the picture fast, because lack of feed can cut into operating cash reserves even faster.

Right after Shoemaker took over management of the Chess-Shoemaker outfit near Canon City, in the Fremont Soil Conservation District in 1955, he started applying a few basic conservation rules with the help of the Soil Conservation Service. One had to do with grass. Shoemaker wanted better grass, and he knew the way to get it lay in easing up on its use, even though that meant cutting the breeding herd from 300 to 200 head.

Shoemaker figures the herd reduction to be a temporary move. With improvement of his range, he eventually will be able to add to the herd, because there will be more grass of better quality. Meanwhile, another factor to be considered is that there's less expense attached to a smaller herd.

Average weight of spring calves, when marketed in the fall, has increased from around 375 to 415 pounds, a 40-pound improvement which Shoemaker attributes mainly to their better range.

Irene Chess and Shoemaker decided in 1959 that their partnership would benefit by entering the Great Plains Conservation Program. It offered a way to get complete conservation on the ranch faster with Federal cost-sharing help, and a complete soil and water conservation system was what they meant to have.

Shoemaker had been building erosion-control dams, with the Agricultural Stabilization and Conservation Program helping in financing this part of his program. The added stockwater, which made unused grass available to their cows, did something else. It raised the water table, and springs long dry started to flow again.

When Shoemaker leveled 37 acres of irrigated land and improved the ditch system, it helped him to get better results with less water. There has been his gully-control work, too, and grass already is growing on the scarred earth.

Shoemaker grows corn for ensilage and follows it with oats and alfalfa. The rancher says he will get 15 to 20 tons of ensilage an acre. At $7 a ton, such a return is hard to beat.

A mountain of hay for Shoemaker's cattle this winter.

Note:—The author is work unit conservationist, Soil Conservation Service, Canon City, Colo.

Young Wayne Shoemaker studies blue grama grass with Author Reagin.

As a result of using the soil conservation district and Great Plains Conservation programs, the Chess-Shoemaker partnership is able to report that the grass is improving; they are selling as many pounds of beef as before, at less cost to produce it, despite cutting their breeding herd by one-third; they no longer have to buy winter feed; and, for the first time in their experience, there was grass left on the winter range at the season's end.

The Chess-Shoemaker ranching business is operating in the black, with built-in drought insurance, so it can withstand any dry year—and almost any string of years—that Plains history teaches may come along.

◆

To check the depth irrigation water soaks in their soil, some irrigators use an inexpensive soil probe made from an unpointed ½-inch steel rod, 4 feet long, with a crosspiece for a handle welded on the top. Such a probe can be made easily in a farm shop, Donald J. Brosz, Kansas State University, points out.

TAME PASTURE WORKS

For Father-Son Team

By Donavon E. Broberg and Gene L. Williams

FATHER and son Joe and Curtis Feist of Velva in North Dakota have at least two good reasons for being boosters of tame-grass pastures as a supplement to their native rangelands—better milk production and stronger and faster-growing calves.

With tame-grass pastures, the Feists have found during several years' experience that they can turn out their cattle on the grass earlier in the spring, handle more cattle on fewer acres, and feel more assured of pasture by using both tame and native grasses.

The Feists operate a 1,325-acre livestock farm in the South McHenry Soil Conservation District, including about 860 acres of native grass and 70 to 100 acres in tame-grass pastures. Crested wheatgrass and bromegrass are the principal tame grasses.

The cattle are turned out in the spring onto a crested wheatgrass pasture when the grass is about 5 inches high; because it is the first grass to green up and is palatable and nutritious. By the time the crested wheatgrass starts becoming stemmy and unpalatable, the bromegrass is ready to pasture; and, after mid-June, another pasture of bromegrass and alfalfa feeds the cattle until the native pastures with their warm-season grasses are ready. This system of management allows each of the grasses to be used when it is the most palatable and productive.

In order to keep their tame-grass pastures in top production, the Feists fertilize regularly with nitrogen, and mow the weeds and stemmy plants to encourage even grazing. Grazing is managed to allow the grass to develop root reserves before winter. Tame-grass pastures also make it easier to maintain the native pastures in top condition.

Feist's tame grass pasture for spring grazing.

Feist, a cooperator with the South McHenry district since 1953, now is participating in the Great Plains Conservation Program. With the help of its cost-sharing, he has built an irrigation dam and spillway, and plans to use the irrigation water for tame pasture, hayland, and forage crops.

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The North Dakota State University says a new grass, Vinall Russian wild rye, could become one of the important grasses in the State. Not only is it as early as or earlier than crested wheatgrass, but it makes good hay and fall pasture.

Note:—The authors are, respectively, agronomist, Bismarck, N. Dak., and work unit conservationist, Velva, N. Dak., both of the Soil Conservation Service.

From Brush to Grass

By Homer A. Taff

BRUSH control on rangelands is one of the conservation practices that is paying off in the Great Plains Conservation Program.

One of the main problems in Texas agriculture is the encroachment of brush—mesquite, juniper, and shinnery oak—onto millions of acres of range. Surveys have showed 55 million acres of mesquite infestation alone. This drought-defying plant spreads rapidly with the dropping of seeds by cattle and other animals.

Getting damaged and low-grade cropland into useful grass cover is a primary objective of the Great Plains Conservation Program. Work done with help from the Agricultural Conservation Program and the Conservation Reserve Program has given further impetus to this undertaking.

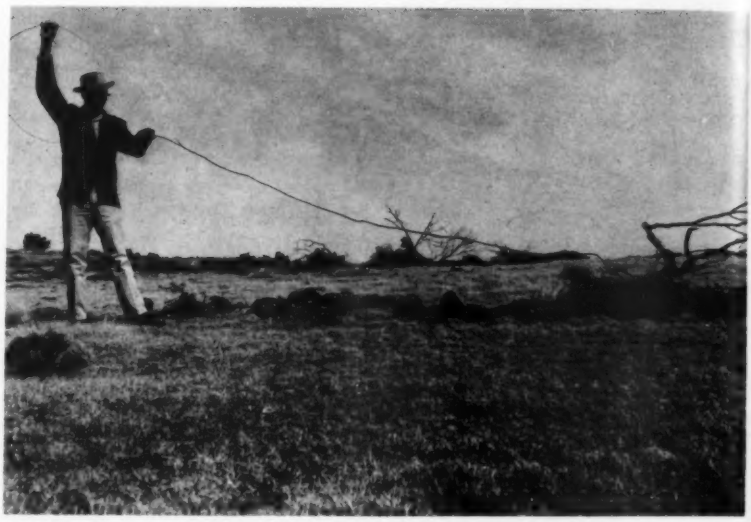
Reseeding drought-damaged range is another tailor-made practice, and development of dependable water for livestock is another. A third is the opportunity to make irrigation systems more efficient.

J. Frank Bennett, rancher in the Cochran Soil Conservation District, reports his range output has more than doubled since he controlled shin oak brush and reseeded 5,606 acres to adapted native species. J. L. Stuart, in the Lipscomb Soil Conservation District, had a similar observation:

"The pastures where I sprayed the brush and deferred grazing have the best grass I have ever seen on them."

He is putting 584 acres of low-grade cropland into grass, among the practices called for in his complete Great Plains Conservation Program.

Grady Halbert of Foard City, chairman of the Lower Pease Soil Conservation District, who has almost completed work on two Great



This 6-foot mesquite tree on Vaugh Hall ranch in Floyd County (Tex.) SCD sapped moisture with 25-foot root before removal under GPCP.

Formerly eroded field on Rhode and Gould farm in Donley County (Tex.) SCD is protected and productive after being seeded to native grass.

Note:—The author is assistant State conservationist, Soil Conservation Service, Temple, Tex.

C. V. Hewitt pasture after rootplowing and reseeding in Howard (Tex.) SCD.

Plains contracts, said, "many farmers in our district would not have been able to make the conservation changes they needed without the kind of help the Great Plains Conservation Program gave them."

Banker O. R. Stark, Jr., of Quitaque, in the Cap Rock Soil Conservation District, took a close look at the Great Plains Conservation Program when it was announced, and became an active supporter of the program, as did many of his customers. He influenced many of them to make use of the program's help in seeking needed land treatment done on the Kent Creek watershed project.

From shin oak to sea of grass in 2 years on J. Frank Bennett ranch in Cochran County (Tex.) SCD.

Timing Is Key To Irrigated-Pasture Management

By Dan L. Herman

CAREFUL timing of their conservation-management operations on irrigated pasture that formerly was cropland is credited by Wyoming livestock growers Lawrence Corbett and Sons of Worland with their success in getting top beef production.

"To get the maximum return from irrigated pasture," Corbett Senior says, "it must be maintained in a lush condition at all times, and proper management is the most important step."

Corbett is a supervisor of the Washakie Soil and Water Conservation District.

Good pasture brings Corbett maximum returns—protects his land.

In developing his conservation plan, he converted 34 acres of cropland to irrigated pasture. The soils map made by Soil Conservation Service technicians showed that the slope on part of this acreage to be 8 percent. By converting to a grass cover, the erosion problem he had been contending with was solved.

Each operation is timed so it fits into the overall plan for proper management of the Corbett pastures. The excellent pastures that have resulted and the increased returns in beef show how this management plan pays.

A rotation cycle of 21-28 days is used. The pastures are fertilized three times—about the first of March, July, and September. They are clipped twice during the season, droppings are scattered three times, and the pastures are irrigated twice during each rest period.

The Corbetts have a cow-calf operation. Grazing begins about May 1, and the stock is on the pastures until October 10. Beef production averages 706 pounds an acre.

"Returns per acre from my irrigated pastures are greater than my

Note:—The author is work unit conservationist, Soil Conservation Service, Worland, Wyo.

returns per acre from beans or small grain crops," Corbetts says. "They must be given the same management and consideration as those of any cash crop. By timing the management on my pastures, they are always in lush condition, giving maximum returns."

The good returns from their conservation-managed irrigated pastures prompted Corbett and Sons to expand their cow-calf operations for 1961, to harvest the grass from an additional 25 acres of pasture seeded last year.

Conserving Runoff Water With the Zingg Conservation Bench Terrace

By Victor L. Hauser

DATA resulting from research evaluation of the Zingg conservation bench terrace at the Southwestern Great Plains Field Station indicate that this slope-control practice will conserve runoff water effectively on dry lands of the southern Plains.

The Zingg terrace system being studied at the Bushland, Tex., station comprises level contour benches and ridges to provide soil erosion control and to retain, spread, and infiltrate surface runoff for improvement of soil moisture and related crop production.

A level contour bench is constructed to serve as a catchment area for surface runoff from both the bench and the contributing area. The terrace ridge serves as the control for impounding and spreading runoff water. Dimensions of the system vary according to slope, soil, land use, and anticipated runoff.

The elements of the system are not new, but their combination and orientation in an attempt to develop a desirable slope-control practice are unique. Level terraces with both open and closed ends have served extensively in dryland regions. Such terraces usually impound surface runoff in a relatively narrow channel, but the runoff water is not distributed uniformly enough or over a great enough area to obtain maximum benefit of the water for crop production.

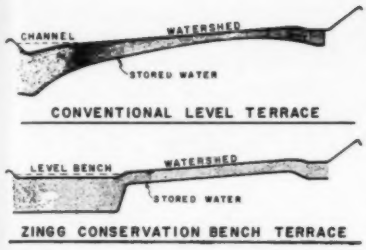
Four benches, 1,100 to 1,500 feet long and 80 to 145 feet wide, were built in the spring of 1955. Each bench is of uniform width throughout its length, to avoid point rows on the bench. A constant ratio of 2 acres of watershed for each acre in the bench was maintained for all benches. Maximum depth of cut and fill was about 1 foot.

Tops of the terrace ridges used to retain runoff on the benches were built 1 foot above the level of the bench. The ridges, which have a slope of about 1:5, were stabilized with permanent vegetation, and the ends of each bench were blocked to hold 6 inches of water on the bench. The system reduces erosion and runoff in the same way that level terraces do, and results in a larger field area being wetted by the runoff water.

Because grain sorghum grows during the summer when runoff may be expected, it is grown continuously on the bench area. The level terraces and the bench water-

Note:—The author is agricultural engineer, Agricultural Research Service, Bushland, Tex.

Water impounded on Zingg conservation benches and on level terraced land.



sheds are cropped in a flexible wheat-grain, sorghum-fallow sequence. Wheat and grain sorghum are planted during their normal planting periods, allowing either 10 or 11 months of fallow before planting each crop, unless the sequence must be broken to maintain wind-erosion control.

Heavy rains during June 1960 provided opportunity for a comparison between conservation benches and level terraces. Rainfall was below average during April (70 percent of average) and May (34 percent of average). The total rainfall for the week of June 5 through 11 was 6.20 inches—2.6 times the average rainfall for the entire month of June. Runoff water impounded on the benches was spread over a wide area in a thin sheet; whereas that impounded above the level terraces was confined to the terrace channel.

One level-terraced field was planted to grain sorghum on June 22, but heavy rains early in July drowned sorghum seedlings in the terrace channels. These heavy rains did not drown sorghum seedlings on benches planted on June 28.

Yields computed for a 100-acre field with a conventional level terrace system and for a field with a Zingg conservation bench system are shown in the tabulation. They were computed from the 4-year average grain production.

Wheat production is lower in the Zingg system because the benches are always in sorghum, and there is less land producing wheat.

The data show that the runoff water impounded on the benches was used more efficiently than runoff water held above the level terraces, and that the benches increased total grain production to about 1.5 times the production from level terraces.

No. 66

This is the sixty-sixth of a series of articles to appear from time to time in explanation of the various phases of research being conducted by the Department of Agriculture on problems of soil and water conservation.

Observations of the Zingg conservation bench terraces over the 1957-60 period indicate the need for precision in leveling the benches. Minor land leveling and some land planing were necessary after 2 years, because excess water drowned areas of the benches which had not been leveled properly.

The Zingg conservation bench terrace is still in the testing stage. Additional studies are under way in other areas of the Plains. More years of results will be needed to determine the production benefits of this measure, compared to others, from the longtime standpoint. Additional information will also be obtained on methods of maintaining the level surface of the bench under normal farming operations.

Results to date indicate that the conservation bench terrace may add another conservation tool to the list from which the farmer or rancher makes his selection to fit the needs of his land.

Average annual production on 100 acres

Treatment	*Wheat* *Pounds*	*Grain sorghum* *Pounds*	*Total* *Pounds*
Zingg conservation bench terrace	20,400	128,400	148,800
Level terrace	30,900	70,900	101,800

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A tillage system for planting corn in cornstalk residues has been developed at the University of Nebraska. As reported by Engineer T. D. Wittmus, it consists of cutting stalks, planting, cultivating, and ridging for planting. A machine has been developed for the planting without any other tillage, and without loss in yields. The experiments showed only .96 of an hour of labor needed for till-planting an acre, as compared to 2.39 hours for conventional tillage, and a cost of only $6 an acre compared to $13.50, with 4-row equipment.

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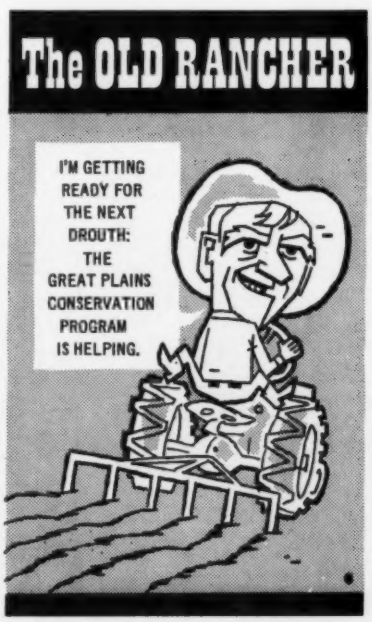
Weed control is even more important in dry years than in wet years, to conserve moisture for crops.



Irrigator Stays With His Farm

But Throws Shovel Away

By O. Wendell Thacker

WHEN Howard Blodgett started farming more than 15 years ago near Sidney, Mont., his irrigation water had to be led around with a shovel. Even if he didn't put the shovel down until he turned the water off again, part of the field got too much and part of it not enough.

In spite of this extra work and inconvenience, there still was a pretty good living on the 262-acre farm, 152 acres of which was irrigated cropland. He was younger then, and labor was available most of the time at a price he could afford. But by 1958 things were different. The cost-price squeeze had wrung out his margin of profit.

"I felt I had reached the end of my rope," he recalls.

He thought of giving up farming to take a job in town, but he wanted to bring up his young sons on the farm.

Upon the advice of the local Farmers Home Administration supervisor, he arranged through the Richland County Soil Conservation District for Soil Conservation Service technicians to make a topographic survey and help him draw up a basic conservation plan based on a map of the soils on his farm. Water management and modification of his cropping system were the major features of his plan. It involved reorganizing his irrigation system, installing turnouts, land leveling, changing the crop rotations, establishing irrigated pastures, developing improved methods of applying irrigation water, and diversification.

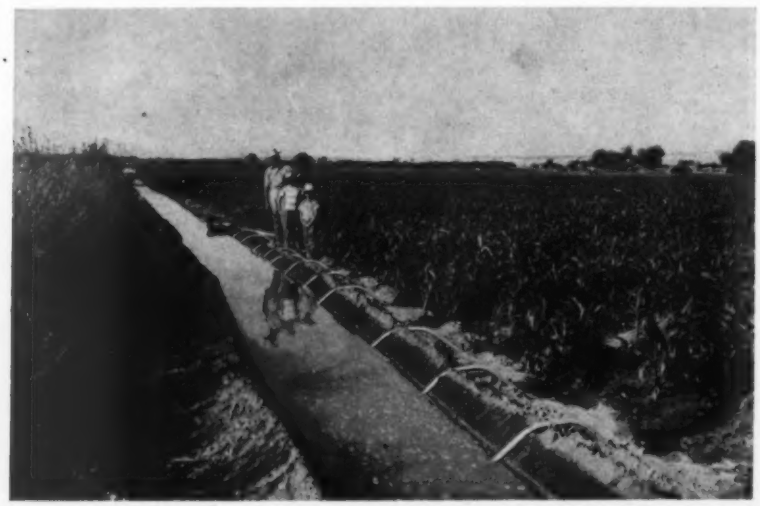
Blodgett leveled 50 acres in 1959 and 1960. He estimates he is already saving more than 40 man-days of irrigating time each season. A 35-acre field he had in sugar beets in 1960 took 2½ to 3 days for each irrigation. Formerly, it required 6 to 10 days and wasn't properly irrigated then. Yields are up about 5 tons an acre.

Blodgett no longer carries a shovel while the water is running. Instead, he sets his siphon tubes and goes about his farming until it's time to move them. Beets require closer attention than corn; so he irrigates beets by day and corn by night, when the "pressure is on." He can handle larger streams of water with better water efficiency and less erosion hazards as a result of his reorganized irrigation system and improved water management. Also, he figures he won't need any seasonal help.

Sugar beets, beans, grain, and hay had been the staple crops in Blodgett's former crop rotations. His conservation plan calls for dropping the beans, raising corn for silage, and planting 20 to 30 acres to irrigated pasture. He hopes to make cattle feeding a part of his operation, as many others in the lower Yellowstone Valley are doing, and thus use his winter time to better advantage and provide manure for his fertility program.

The increased acreage of hay and irrigated pasture will stabilize sugar-beet production through better disease control and increased fertility. It also will contribute further to better beet yields, by decreasing the peak summer-labor requirements, and allowing timely completion of irrigation and other farming operations.

His water is supplied by the Sidney Water Users Association. Blodgett also used FHA financing and ACP cost-sharing.



Blodgett, with 2 sons, irrigating leveled land with recently installed siphon tubes.

Note:—The author is agronomist, Soil Conservation Service, Lewistown, Mont.

Judge Beauchamp with dairy cattle in Coastal bermudagrass pasture formerly in thick oak timber.

Retired Judge Turns Conservation Farmer

By Clifford J. Novosad and Marshall H. Nichols

MOST men take up some hobby like fishing or golfing when they retire. But not Judge Tom L. Beauchamp of the Texas Court of Criminal Appeals. He turned to livestock farming—the conservation way.

When that time arrived for 70-year-old Judge Beauchamp in June 1953, he bought 310 acres along the Red River in the North Texas Soil Conservation District. By August he had asked the district supervisors for help in working out a basic conservation plan for his Lamar County farm.

The place provided the Judge a readymade opportunity to practice his firm philosophy of man's duty to the land. The farm had many problems. Brush was a problem on 207 acres. The existing pastures were severely overgrazed and had very poor stands of a base grass. There was no adequate supply of livestock water. The best soils were too wet for growing cash crops. But to Judge Beauchamp these problems were a challenge and an opportunity.

When asked why he went into farming, he said: "Most men take up fishing, golfing, or hunting after retirement; but the fish wouldn't bite for me, the deer ran from me, and I wasn't old enough to play golf. Farming was also good for my health, as well as an opportunity to practice conservation and land improvement."

With the help of Soil Conservation Service technicians, Judge Beauchamp planned brush clearing, improvement of the existing pastures, and establishment of a base grass where brush was to be cleared and on old cropland fields. He also planned two more farm ponds for livestock water.

In 1961 his accomplishments in conservation land improvement can be seen to be paying off. He has cleared the brush and trees and planted Coastal bermudagrass on the 207 acres. He has renovated the old Common bermudagrass pastures by overseeding with legumes and putting on fertilizer. He fertilized his pastures according to soil analyses and has brought them into a high state of production. He practices good pasture use by leaving a top growth of at least 4 inches on Common bermudagrass and 6 inches on Coastal bermudagrass throughout the year.

Judge Beauchamp bought another farm, of 252 acres, in 1959 and developed a conservation plan for it, too. He has made good progress on the practices planned for the second place.

"I want to leave my land in the best state of improvement possible for the next owner or operator," is the way he sums up his conservation philosophy.

"A man has a duty, an obligation, and a responsibility to improve the land he owns. I would not have land if I couldn't improve it."

Note:—The authors are, respectively, agronomist, Denton, Tex., and work unit conservationist, Paris, Tex., both of the Soil Conservation Service.

Judge Tom L. Beauchamp's dairy cattle grazing 3-year-old Coastal bermudagrass pasture.

Feed 'Em and Reap

By W. N. Parmeter

MARVIN Wilkensen's favorite slogan is "feed 'em and reap" when he is discussing his lamb feeding operations. Wilkensen operates a 200-acre farm on the Angostura Irrigation Project, and is a cooperator with the Fall River County Soil Conservation District in South Dakota.

In 1959, he produced 454 pounds of lambs and 70 pounds of mutton an acre on 28 acres of irrigated pasture. To obtain this excellent return, he has subdivided the 28 acres into 5 pastures so that he can rotate the lambs from one pasture to another every 6 days and give each pasture 24 days' rest between grazing periods.

After a pasture has been grazed, it is clipped, if necessary, to keep the plants succulent. Four inches of irrigation water applied soon after a pasture has been grazed provides moisture for the next grazing period. The pastures are fertilized with 80 pounds of actual nitrogen and 40 pounds of phosphorus per acre, when needed.

The lambs are fed out in the fall on shelled corn and alfalfa hay. After the sugar-beet harvest, beet tops are fed, also. Additional lambs are bought and fed according to feed available on the farm.

Four of the 5 pastures were seeded to 2 pounds of alfalfa and 8 pounds of smooth bromegrass per acre. The fifth pasture, used for lambing out, was seeded to 6 pounds of intermediate wheatgrass. Wilkensen likes to establish his pastures between the 1st and 15th of September, by irrigating small grain stubble after harvest and then seeding the grass in the stubble without any seedbed preparation.

Wilkensen is a graduate of the University of Nebraska, with a major in soils. He taught vocational agriculture for 4 years, and spent 5 years as a soil scientist for the Soil Conservation Service and one year with the Bureau of Reclamation as a land classifier before he started farming.

Marvin Wilkensen in one of his sugar beet fields.

The Angostura Irrigation Project lands were purchased by the Government through the Case-Wheeler Act in the 1930's. They were developed for irrigation before they were put in the hands of veterans through a drawing of numbers for choice of farms to purchase. Most of the farms had little or no improvements. At the first drawing in the spring of 1953, Wilkensen drew the 17th place out of 26. However, he was fortunate in getting his second choice in the farms he asked for.

Last year, Wilkensen's irrigated crops consisted of 15 acres of wheat, 37 acres of sugar beets, 23 acres of alfalfa hay, 13 acres of corn, 7 acres of oats, and 28 acres of pasture.

"By rotating my irrigated sheep pastures, I am getting yields that make the net returns higher than for any other crop I grow except sugar beets; and, to a large extent, the fertilizer stays on the farm," says Wilkensen.

Note:—The author is agronomist, Soil Conservation Service, Huron, S. Dak.

Some of Marvin Wilkensen's lambs feeding on one of his alfalfa-brome pastures.

No More Floodwater for Cimarron

By Gerald R. Riepl

One of the watershed dams helping to prevent flooding of Cimarron, in background.

CIMARRON and surrounding irrigated lands in southwest Kansas are free for the first time in many years of their periodic floodwater plague because of completion of a small-watershed protection and flood prevention project.

Chief cause of flooding was abandonment of the early-day Eureka irrigation canal, built in the 1880's to supply water for the Arkansas River valley across Gray and Ford Counties. The ditch was the inspiration of English millionaire Asa Soule, who believed that this part of the country held untold wealth if it only could be unlocked. The irrigation canal was only one of many projects he presented to this part of Kansas. He built a college at Dodge City and a railroad, among many other things.

The canal, which some say cost a million dollars, took water from the Arkansas River by a system of outlet gates, and wound around the hills for 70 miles until it reached the plains above the Arkansas River valley. It is estimated that between 3 and 4 million cubic yards of dirt were moved in building the canal—an impressive construction feat with horses and mules that provided the literal "horsepower" in those days. The canal, besides operating as an irrigation channel, also served as a floodwater-retarding structure in heavy rains.

Another of the structures helping protect Cimarron.

The irrigation system worked successfully until 1921, when a major flood on the Arkansas severely damaged the diversion intake works, and the canal was abandoned for irrigation, though it still operated as a deterrent to floods in Cimarron. But when the canal later was closed at Cimarron to make way for streets, severe flooding promptly occurred, because of the blocked drains, and became more frequent and violent. After a severe flood in 1951, an informal group of Cimarron people, organized under the Kansas Watershed Law in 1954, asked for help from the Gray County Soil Conservation District. Cimarron, with a population of 1,200, is nearly in the middle of the watershed.

A Soil Conservation Service watershed planning party started work in Cimarron in the spring of 1955, just as the area was flooded by heavy late May and early June rains totaling 12 inches in a 3-week period and 9 inches in 72 hours.

The plan developed provided for four floodwater-retarding structures and floodways to carry overflow from the principal and emergency spillways to the Arkansas River, a diversion from a drain behind one of the structures, and land-treatment measures determined by the soil conservation district. Also, as floodwater-retarding structures were completed and as needed protection was given floodplain land, work began in developing 400 acres for irrigation.

The necessary land treatment was completed and easements were obtained in 1958. When the con-

Note:—The author is work unit conservationist, Soil Conservation Service, Cimarron, Kan.

tract was let, the first soil was turned with a golden spade at a dedication ceremony in January 1959, and construction started on Project No. 1 in March.

Two floodwater-retarding structures were completed in mid-June 1959, and seeding and mulching were completed in January 1960.

Equipment used included a mulcher, two tractors, a disk, harrow, chisel, and a straight serrated disk. The earth was tilled 2 inches deep and packed with a spike-tooth harrow. The grass was seeded with a double disk furrow-opener drill with drag chains and 12-inch spacing.

The mulch was blown on, and the serrated disk anchored the mulch to 2-inch depth.

The structures showed their potential for controlling flooding when 3 inches of rain fell within 2 weeks after completion and heavy rains with a great amount of runoff came during September and October. The principal spillway failed to flow, because nearly 100 percent land treatment above the structures, particularly with level terraces, controlled the runoff.

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Tests have shown that early-cut alfalfa makes better hay than late-cut alfalfa, even if it is short or has been rained on, with added nutrients in the early-cut hay offsetting the fewer extra pounds of poorer quality late hay.

OUR SOILS AND THEIR MANAGEMENT. By R. C. Donahue. 568 pp. Illus. 1961. The Interstate Printers and Publishers, Inc.: Danville, Ill. $6.50.

This comprehensive book is an introduction to soil and water conservation. It is well illustrated, easy to read, and should be of interest to the layman as well as agricultural students and land owners and operators.

Our Soils and Their Management deals with soil management. The first part of the book discusses, in some detail, organic matter, lime, fertilizers, tillage, soil and water conservation, irrigation, and drainage. The remainder of the book is devoted to the management of soils and water when the soils are used for (1) field crops, (2) gardens, (3) lawns, (4) pastures, (5) rangelands, and (6) forests. Soil and water management for each of these uses is discussed in an individual chapter. The nonagriculturist will be especially interested in the chapters on managing soils for lawns and gardens.

This is an excellent book for the beginner student in soil management. It is written in a style that can easily be read and understood by a person with limited technical background. Numerous illustrations help to make this book more interesting and easily understood. This should be an excellent reference for vocational agricultural students. Students and laymen interested in agriculture will find this a valuable book that contains a wealth of information on soils and their management.

—P. H. MONTGOMERY

Have You Seen?...

● *Soil Erosion By Wind and Measures for Its Control on Agritural Land*, published by Food and Agriculture Organization of the United Nations, obtainable from Columbia University Press, International Documents Service, 2960 Broadway, New York 27, N. Y. This bulletin summarizes basic information on wind erosion and practices for its control, including some interpretation and application of existing knowledge to conditions in less developed countries.

● *How To Control Soil Blowing*, USDA Farmers' Bulletin 2169. It gives causes of and remedies for soil blowing. Some of the measures discussed are stubble mulching, cover crops, stripcropping, crop rotations and fallowing, windbreaks, and rough and emergency tillage.